SPX otc

SABRE HP
BATTERY / ELECTRICAL SYSTEM DIAGNOSTIC TESTER
USER GUIDE

IMPORTANT NOTICES

SAFETY

All Danger, Warning and Important notes must be followed for your safety. These safety messages are in the following formats:

⚠ DANGER:

- **Means you may risk possible loss of life**

⚠ WARNING:

- **Means you may risk possible bodily harm**

IMPORTANT: Means you risk damage to the vehicle or the tool

Notes: *are added to provide clarity and helpful tips*

These safety messages cover situations SPX is aware of. SPX cannot know, evaluate and advise you as to all of the possible hazards. You must be certain that any conditions or service procedures encountered do not jeopardize your personal safety.

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SABRE HP
USER GUIDE

BATTERY AND
ELECTRICAL SYSTEM
DIAGNOSTIC TESTER

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Safety Precautions

⚠ DANGER:

- When an engine is operating, keep the service area WELL VENTILATED or attach a building exhaust removal system to the engine exhaust system. Engines produce carbon monoxide, an odorless, poisonous gas that causes slower reaction time and can lead to serious injury or death.

⚠ WARNING:

- Wear an American National Standards Institute (ANSI) approved eye shield when testing or repairing vehicles. Objects propelled by whirling engine components or pressurized liquids escaping may cause personal injury.

- Set the parking brake and block the wheels before testing or repairing a vehicle. It is especially important to block the wheels on front-wheel drive vehicles because the parking brake does not hold the drive wheels.

- Do not drive the vehicle and operate the tester at the same time. Any distractions may cause an accident. Have one person operate the tester as another person drives the vehicle.
- Maintain adequate clearance around moving components or belts during testing. Moving components and belts can catch loose clothing, body parts, or test equipment and cause serious damage or personal injury.

- Automotive batteries contain sulfuric acid and produce explosive gases that can result in serious injury. Stand back from the battery during testing. To prevent ignition of gases, keep lighted cigarettes, sparks, flames, and other ignition sources away from the battery at all times.

- Do not test a frozen battery, as it may explode. Allow the battery to warm up before testing.
- Do not spray liquids on the tester. Liquids may enter the tester and cause permanent damage to the electrical components. Flammable liquids may cause an explosion.
- Do not use the test leads if the insulation is damaged or if metal is exposed.

- Do not remove the test leads while a test is running.
- Do not touch the test leads, tips, or the circuit being tested.
- Refer to the service manual for the vehicle being serviced and adhere to all diagnostic procedures and precautions.

IMPORTANT:

To prevent damage to the vehicle computer when disconnecting battery cables:

- Turn the ignition and all accessories and loads off. Close the vehicle doors and trunk lid.
- Remove the negative battery cable first, then remove the positive cable.

1: General Information

The SABRE HP is a portable, hand-held tool that lets you test the condition of 6 or 12 volt batteries and lets you quickly test the starting / charging system of vehicles. In addition, the SABRE HP has a multimeter function for use with optional amp probes and has a printing function for use with an optional printer.

The SABRE HP tests flooded lead acid and absorbed glass mat (AGM) batteries within the 50 to 1999 Cold Cranking Amp (CCA), Cranking Amp (CA), Amp Hours (A-HR), Japanese Industrial Standard (JIS), or German-Duetche Industry Norm (DIN) capacity ratings.

Component Identification

Depending on which kit you purchased, the SABRE HP includes the following system components:

- Carrying Case
- User Guide
- SABRE HP Tester
- Terminal Adapters
- Test Lead with Battery Clamps
- Amp Probes (optional)
- Printer (optional)

SABRE HP Tester

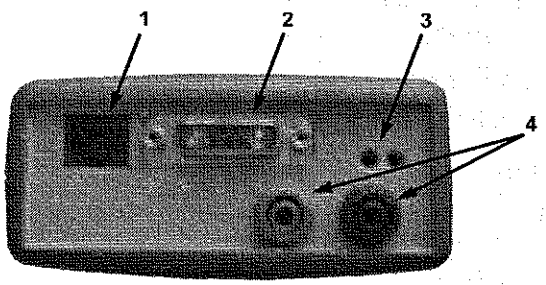


Figure 1.1: SABRE HP Tester, Top View

The top of the tester has the following components:

Item 1 RJ45 Port - connects a personal computer (PC) for updating the internal software.

Item 2 Test Lead Port - connects the battery clamp test lead.

Item 3 Infrared Lights - outputs signals to the printer for printing test results.

Item 4 Red and Black Jacks - connects an optional amp probe for using the multimeter function.
USE ONLY THE AMP PROBES DESCRIBED IN THIS GUIDE; DO NOT USE THESE JACKS FOR OTHER ANY OTHER LEADS.

Figure 1.2: SABRE HP Tester, Back and Front Views

The front and back of the tester have the following components:

Item 1 Digital Display - displays up to four lines of test instructions and results.

Item 2 Keypad - has the following keys:

- **MENU** - returns the display to the main menu screen.
- **Up and Down Arrows** - scrolls up and down on a screen or within a data field for making selections on the screen.
- **GO** - executes a screen command and advances to the next screen or step in a procedure.
- **OFF** - turns the tester off when it is not connected to a battery.
- **ON** - turns the tester on when it is not connected to a battery. (When properly connected to a battery, the tester turns on automatically.)

Item 3 Security Cable Connector - attaches a security cable for protecting against theft, loss, or dropping.

Item 4 Battery Compartment - holds one 9-volt battery.

Terminal Adapters

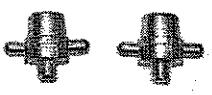


Figure 1.3: Terminal Adapters

The two terminal adapters are for testing side-post batteries that are not installed in vehicles. Each adapter has a threaded end that screws into the battery.

Test Lead with Battery Clamps

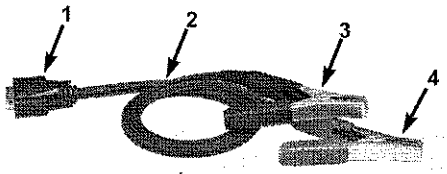


Figure 1.4: Test Lead with Battery Clamps

The test lead has the following components:

Item 1 Connector - connects to the top of the tester.

Item 2 3-foot cable

Item 3 Black Clamp - connects to the battery's negative terminal.

Item 4 Red Clamp - connects to the battery's positive terminal.

Note: *An optional, 10-foot test lead is available (P/N 3172).*

Amp Probes (optional)

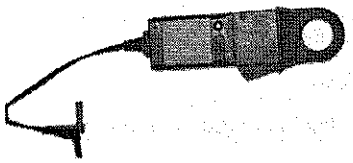


Figure 1.5: Amp Probe

The following optional amp probes are available for use with the tester's multimeter function.

- Low Range Amp Probe (P/N 3173) for current drain tests.
- High Range Amp Probe (P/N 3174) for starting / charging system tests.

Printer (optional)

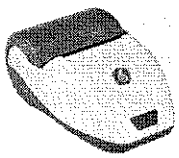


Figure 1.6: Infrared Printer

The printer (P/N 3169) is an infrared printer. For information about the printer, refer to "***Chapter 5: Printer (Optional)***" on page 15.

Software Overview

When the SABRE HP is turned on, the first screen in the Digital Display is a main menu, described below.

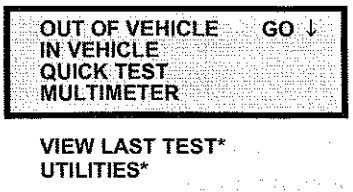


Figure 1.7: Main Menu Screen
***View Last Test and Utilities show when you scroll down**

OUT OF VEHICLE: tests a 6 or 12 volt battery that is not installed in a vehicle. This test determines the battery condition and displays the results (good, bad, etc.) along with the battery's open circuit voltage (OCV). For instructions, refer to page 3.

IN VEHICLE: tests a 6 or 12 volt battery that is installed in a vehicle. This test determines the battery condition and then lets you end the test or continue with a test of the vehicle's starting / charging system. The test results include the battery condition and the condition of the vehicle's charging system, starting system, and diodes. For instructions, refer to page 4.

QUICK TEST: determines the condition of a 6 or 12 volt battery and displays the open circuit voltage (OCV), cold cranking amps (CCA), cranking amps (CA), ampere hours (A-HR), Japanese Industrial Standards (JIS), and German-Duetche Industry Norm (DIN) as applicable. For instructions, refer to page 6.

MULTIMETER: determines the battery voltage and electrical current. For instructions, refer to page 10.

VIEW LAST TEST: displays the results of the last test performed. For instructions, refer to page 7.

UTILITIES: has the following options:

- **Set Time / Date** - lets you set a date and time for printing on test results.
- **Software Update** - when properly connected to a PC, updates the software.
- **Unit Version** - displays information about the software, such as name, version number, etc.
- **Test Counters** - displays the number of tests done with the tester and lets you reset these counters to zero.
- **Edit Header/Footer** - lets you add information for printing on test results, such as your shop name or a message.
- **Amp Probe Setup** - turns on (or off) the amp probe for Multimeter testing.
- **Stored Tests** - stores the results for up to 25 tests for you to review later.

For instructions, refer to page 11.

2: Battery and System Tests

This chapter includes the following sections:

- Pretest Steps
- Out-of-Vehicle Battery Test
- In-Vehicle Battery and Electrical System Test
- Quick Test (Battery)
- View Last Test Results
- Understanding Test Results

Pretest Steps

To prepare for testing, follow these steps:

1 Check the following:

- If the battery being tested is frozen, let it warm up before testing.
- Make sure that the terminals of the battery being tested are clean and dry; brush and clean gently if necessary.
- If the battery being tested was recently charged or used (is in a vehicle that had the engine running), let the battery stabilize 3 minutes before testing. Otherwise, let the battery stabilize 1 minute before testing.
- If testing a battery installed in a vehicle, make sure the contact between the battery terminals and cables is not oxidized or loose, which causes cranking and charging problems and may falsify the test results.
- If testing a battery installed in a vehicle, turn off all sources that may drain current from the battery. For example, turn the vehicle's ignition key and all accessories and other loads off, close the doors and trunk, and disconnect the under-hood light.

  Note: *For dual battery systems, test the batteries individually. First disconnect one and test the other, then repeat for the other battery.*

2 Install a 9-volt battery in the tester's battery compartment. (To open the compartment, slide the cover toward the bottom of the tester.)

3 Connect the test lead (the one with the battery clamps) to the test lead port on the top of the tester. Finger-tighten the connector's screws.

4 If necessary, connect the optional side-post adapters to the battery.

5 Attach the test lead's clamps to the battery's terminals: red to positive (+); black to negative (-).

Note: *The tester turns on automatically when properly connected to the battery. If it does not turn on, check the connections. Both clamps must make a solid contact with the terminals.*

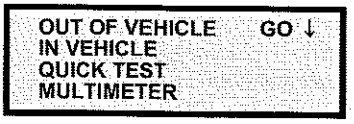
6 Continue with the appropriate test steps (in the next three sections).

OUT OF VEHICLE Battery Test

The OUT OF VEHICLE test takes about 13 seconds to determine if the battery is good, has a low charge, or is bad. The test shows the battery condition even if the battery is discharged down to 1 volt state of charge.

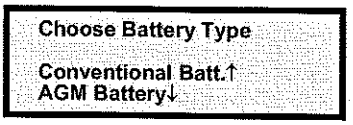
To do the OUT OF VEHICLE test, follow these steps:

1 Do the steps in "**Pretest Steps**". This displays the main menu on the tester.



Note: *The word GO indicates the selected item.*

2 Use the **Up** and **Down Arrow** keys to select **OUT OF VEHICLE** and then press the **GO** key. This displays the Choose Battery Type screen.



3 Do one of the following:

- If the battery is conventional (flooded lead acid), press the **Up Arrow** key.
- If the battery is AGM, press the **Down Arrow** key.

This displays the battery's open circuit voltage (OCV).

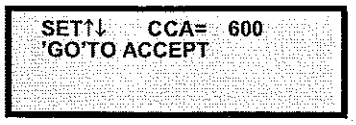
4 Press the **GO** key. This displays the Select Units screen.

5 Use the **Down Arrow** key to select a capacity rating for the test. The two asterisks (**>) indicate the selected line.

Note: *This is the battery's capacity rating that is usually found on the battery's label. Depending on the battery, use any of the following:*

- ***CCA*** *- cold cranking ampere rating*
- ***CA / MCA*** *- cranking ampere / marine cranking ampere rating*
- ***A-HR*** *- ampere hours*
- ***DIN*** *- German-Duetche industry norm*
- ***JIS*** *- Japanese industrial standard*

6 After selecting a capacity rating, press the **GO** key. This displays a screen for entering the capacity rating.



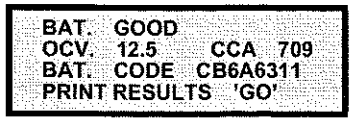
7 Use the **Up** and **Down Arrow** keys and adjust the rating until it matches the rating on the battery's label.

Note: *Do not use the rating reported by the tester because it is typically higher than the printed rating for a newer battery.*

8 Press the **GO** key to begin the load and recovery part of the test. The screen displays ***First Load On***, ***Second Load On***, ***Recovery Period***, and then ***Working*** as it applies two medium loads to the battery followed by recovery periods and then determines the battery condition.

Note: *If the tester senses abnormal conditions, such as a cold battery, other screens may display. Respond to any questions as necessary.*

9 When the test is complete, the screen displays the battery condition, the open circuit voltage (OCV), the cold cranking amps (CCA), and the battery warranty encryption code (for warranty claims).



Note: *For some capacity ratings, the A-HR reading appears instead of the CCA reading. For the JIS capacity rating, the JIS code displays.*

10 Analyze the test results. For descriptions of possible test results, refer to "**Understanding Test Results**" on page 8.

11 If you have the printer, optionally print the test results. For details, refer to "**Printing**" on page 18.

12 To end the test and return to the main menu, press the **MENU** key.

13 Select another test or disconnect the clamps from the battery.

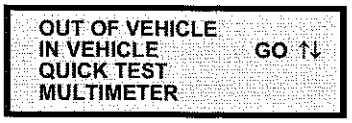
14 Press the **OFF** key to turn the tester off. (The tester turns off automatically after a few minutes of inactivity.)

IN VEHICLE Battery and Electrical System Test

The IN VEHICLE test is a 35 second test to determine the condition of the battery and the vehicle's starting (cranking) system, diodes, and charging system.

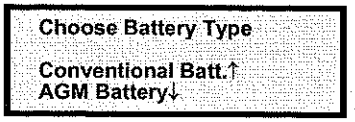
To do the IN VEHICLE test, follow these steps:

1 Do the steps in "**Pretest Steps**" on page 3. This displays the main menu on the tester.



Note: *The word GO indicates the selected item.*

2 Use the **Up** and **Down Arrow** keys to select **IN VEHICLE** and then press the **GO** key. This displays the Choose Battery Type screen.



3 Do one of the following:

- If the battery is conventional (flooded lead acid), press the **Up Arrow** key.
- If the battery is AGM, press the **Down Arrow** key.

This displays the battery's open circuit voltage (OCV).

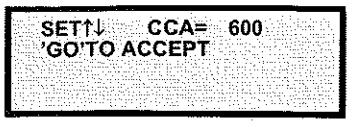
4 Press the **GO** key. This displays the Select Units screen.

5 Use the **Down Arrow** key to select a capacity rating for the test. The two asterisks (**>) indicate the selected line.

Note: *This is the battery's capacity rating that is usually found on the battery's label. Depending on the battery, use any of the following:*

- ***CCA*** *- cold cranking ampere rating*
- ***CA / MCA*** *- cranking ampere / marine cranking ampere rating*
- ***A-HR*** *- ampere hours*
- ***DIN*** *- German-Duetche industry norm*
- ***JIS*** *- Japanese industrial standard*

6 After selecting a capacity rating, press the **GO** key. This displays a screen for entering the capacity rating.



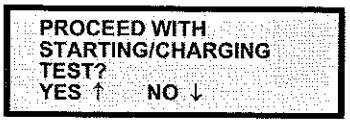
7 Use the **Up** and **Down Arrow** keys and adjust the rating until it matches the rating on the battery's label.

Note: *Do not use the rating reported by the Quick Test because it is typically higher than the printed rating for a newer battery.*

8 Press the **GO** key to begin the test. The screen displays ***First Load On***, ***Recovery Period, Second Load On***, ***Recovery Period***, and then ***Working*** as it applies two medium loads to the battery followed by recovery periods.

Note: *If the tester senses abnormal conditions, such as a cold battery, other screens may display. Respond to any questions as necessary.*

9 Wait for the screen to display "Proceed with Starting / Charging Test?"

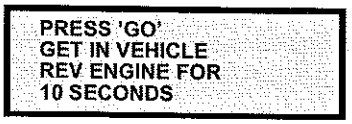


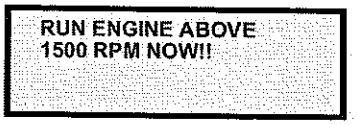
10 Do one of the following:

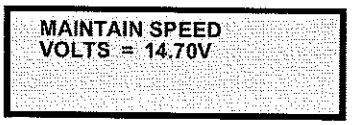
- To start the test, press the **Up Arrow** key and continue with the next step.
- To stop the test, press the **Down Arrow** key. This displays the Battery Test results. For instructions, refer to step 9 on page 4.

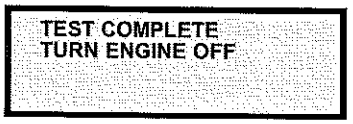
11 Start the vehicle's engine and then press the **GO** key. This starts the test and displays the series of screens shown in the next column.

Note: *If the engine does not start, press the MENU key. This displays the battery test results as described in* step 9 on page 4. *Charge the battery or use a booster battery to provide power*

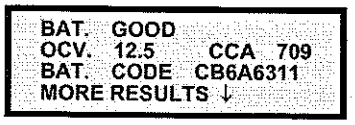








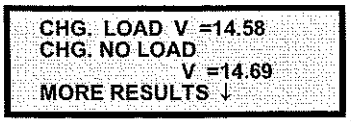
12 Follow the instructions given on the screens to hold the engine RPM at 1500 for 10 seconds and then turn the engine off. The test results display immediately.



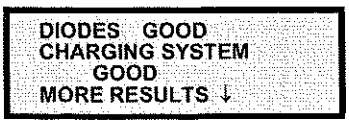
Note: The test results appear on several screens. They may include special messages, readings, or condition results. To view each screen, use the Down Arrow key. The following steps are examples from a good battery and system. For test result descriptions, refer to "Understanding Test Results" on page 8.

13 If the battery and system test is good, the first screen of test results displays the battery test results (shown above). These include battery condition, open-circuit voltage (OCV), actual cold cranking ampere rating (CCA), and battery encryption code (for warranty purposes). Press the **Down Arrow** key to display the next screen (shown on the next page).

Note: *Other possible results for the first screen include NO START CONDITION, CHARGING VOLTS TOO LOW, BAT. GOOD/ LOW CHARGE, BAT. BAD, and BAT. CHARGE AND RETEST.*

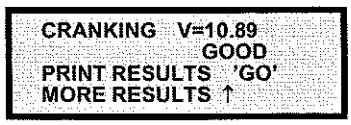


14 The second screen of test results displays charging system test results, which includes loaded and open-circuit (no load) voltages. Press the **Down Arrow** key to display the next screen.



15 The third screen of test results also displays charging system test results, which includes the condition of the diodes and charging system. Press the **Down Arrow** key to display the next screen.

Note: *Possible diode results are GOOD or CHANGE. Possible charging system results are GOOD or CHARGING SYSTEM NEEDS REPAIR.*



16 The fourth screen of test results displays the starting system test results, which includes the cranking voltage (voltage during starting) and condition.

Note: *When you reach the last screen, optionally use the* ***Up Arrow*** *key to review the previous screens.*

17 If you have the printer, optionally print the test results. For details, refer to "**Printing**" on page 18.

18 To end the test and return to the main menu, press the **MENU** key.

19 Select another test or disconnect the clamps from the battery.

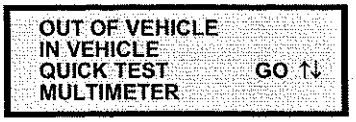
20 Press the **OFF** key to turn the tester off. (The tester turns off automatically after a few minutes of inactivity.)

QUICK TEST (Battery)

The QUICK TEST is a 1 second test to determine the battery voltage and actual Cold Cranking Amperes (CCA), Cranking Ampere rating (CA), Ampere Hours (A-HR), Japanese Industrial Standard (JIS), and German-Deutche Industry Norm (DIS) if applicable.

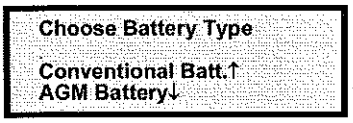
To do the QUICK TEST, follow these steps:

1 Do the steps in the Pretest Steps section (page 3). This displays the main menu on the tester.



Note: *The word GO indicates the selected item.*

2 Use the **Up** and **Down Arrow** keys to select **QUICK TEST** and then press the **GO** key. This displays the Choose Battery Type screen.



3 Do one of the following:

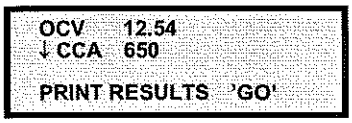
- If the battery is conventional (flooded lead acid), press the **Up Arrow** key.
- If the battery is AGM, press the **Down Arrow** key.

This displays the battery's open circuit voltage (OCV).

4 Press the **GO** key to begin the test. The screen displays ***Working*** as determines the battery's charge.

Note: *If the tester senses abnormal conditions, such as a cold battery, other screens may display. Respond to any questions as necessary.*

5 When the test is complete, the screen displays the open circuit voltage (OCV) and the cold cranking amps (CCA).



6 Repeatedly press the **Down Arrow** key to change the second line to cranking amps (CA), then ampere hours (AHR), then back to CCA.

7 If you have the printer, optionally print the test results. For details, refer to "**Printing**" on page 18.

8 To end the test and return to the main menu, press the **MENU** key.

9 Select another test or disconnect the clamps from the battery.

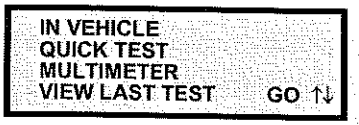
10 Press the **OFF** key to turn the tester off. (The tester turns off automatically after a few minutes of inactivity.)

VIEW LAST TEST Results

The VIEW LAST TEST function displays the test results of the last test performed.

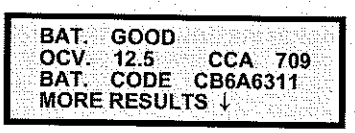
To view the last test results, follow these steps:

1 If necessary, press the **ON** key to turn the tester on and display the main menu. (If the tester is already on, press the **MENU** key to display the main menu.)



Note: *The word GO indicates the selected item.*

2 Use the **Up** and **Down Arrow** keys to select **VIEW LAST TEST** and then press the **GO** key. This displays the test results.



3 If necessary, use the **Down Arrow** key to scroll through the test results.

4 If you have the printer, optionally print the test results. For details, refer to "**Printing**" on page 18.

5 To return to the main menu, press the **MENU** key.

6 Select another test or disconnect the clamps from the battery (if connected).

7 Press the **OFF** key to turn the tester off. (The tester turns off automatically after a few minutes of inactivity.)

Understanding Test Results

This section includes descriptions for test results and tips for solving problems.

Battery Test Results

BAT. GOOD: the battery is in good condition and can hold a charge. This also indicates that the charging system, cranking system, and diode test will be unaffected by the battery condition.

BAT. GOOD / LOW CHARGE: the battery is in good condition but needs charging. (The battery charge is above 15% but not close to the full nominal capacity.)

BAT. CHARGE & RETEST: the battery is almost fully discharged and the battery condition cannot be determined reliably. (The battery charge is below 15% of the nominal capacity). Charge the battery and repeat the test.

BAT. BAD: the battery is in bad condition and would most likely not hold enough of a charge for reliable vehicle starting. Replace the battery.

Note: *A bad battery can mask other charging system problems that will be caught when tested with a good battery. For example, a bad battery could make the diodes look bad.*

System Test Results

VEHICLE MAY HAVE KEY OFF DRAIN: indicates the charging system is probably in good condition but the battery has a low charge. Suspect excessive parasitic current drain or accessories left on during the test.

CHARGE BATTERY AND RETEST SYSTEM: indicates the battery either has a low charge or is almost fully discharged and must be charged before the tester will run any tests.

REPLACE BATTERY AND RETEST SYSTEM: indicates the battery is bad and must be replaced before the tester will run any tests.

DIODES GOOD: indicates the rectifier diodes are good.

CHANGE DIODES: indicates the diode pack or alternator needs replacing.

Note: *To prevent an erroneous diode test, the tester does not test diodes unless the battery condition is good.*

CHARGING SYSTEM GOOD: indicates the charging system is in good condition.

CHARGING VOLTS TOO LOW / CHARGING SYSTEM NEEDS REPAIR: indicates the charging system voltages are too low or the charging system is bad. If the no load voltage is too low, the battery test result may be GOOD/LOW CHARGE. This may also be the result if a heavy-power-consumption device was on during the test. If so, the message, "Was any accessory left on" may display. If so, check if any accessories were on, doors were open, etc. during the test. If they were not, the test result may indicate a battery with low charge.

CRANKING GOOD: indicates the starting system is in good condition.

NO START CONDITION: indicates the battery is bad or needs recharging. This result may also appear if the battery is too small for the vehicle, if the starter motor is defective, or if the cranking resistance is excessive. Make sure the battery size is correct and there are no starter or engine problems.

3: MultiMeter

The Multimeter function lets you quickly check a battery's voltage, and, with optional amp probes, lets you test the electrical current for the ranges of 1mV/Amp, 10 mV/Amp, and 100mV/Amp.

This chapter includes the following sections:

- Pretest Steps
- AMP PROBE SETUP
- MULTIMETER Test

Pretest Steps

To prepare for multimeter testing, do the following:

1 Check the following:

- If the battery being tested is frozen, let it warm up before testing.
- Make sure that the terminals of the battery being tested are clean and dry; brush and clean gently if necessary.
- If the battery being tested was recently charged or used (is in a vehicle that had the engine running), let the battery stabilize three 3 minutes before testing. Otherwise, let the battery stabilize one (1) minute before testing.
- If testing a battery installed in a vehicle, make sure the contact between the battery terminals and cables is not oxidized or loose, which causes cranking and charging problems and may falsify the test results.
- If testing a battery installed in a vehicle, turn off all sources that may drain current from the battery. For example, turn the vehicle's ignition key and all accessories and other loads off, close the doors and trunk, and disconnect the under-hood light.

  Note: *For dual battery systems, test the batteries individually. First disconnect one and test the other, then repeat for the other battery.*

2 Install a 9-volt battery in the tester's battery compartment. (To open the compartment, slide the cover toward the bottom of the tester.)

3 Connect the test lead (the one with the battery clamps) to the test lead port on the top of the tester. Finger-tighten the connector's screws.

4 Insert the amp probe's lead pins into the jacks on the top of the tester; black pin to black jack, red pin to red jack.

Note: *Use only the amp probes described in this guide; do not use the jacks for any other leads.*

5 If necessary, connect the optional side-post adapters to the battery.

6 Attach the test lead's clamps to the battery's terminals: red to positive (+); black to negative (-).

Note: *The tester turns on automatically when properly connected to the battery. If it does not turn on, check the connections. Both clamps must make a solid contact with the terminals.*

7 Clamp the amp probe around the wire being tested.

8 Continue with the Amp Probe Setup steps that follow.

AMP PROBE SETUP

To use the optional amp probes with the Multimeter function, you must first set up the amp probe that is connected to the tester.

Note: *If you do not set up the amp probe, the Multimeter function displays only the battery voltage.*

To set up the amp probe, do the following:

1 Follow the instructions in "**Pretest Steps**". This displays the main menu.

Note: *The word GO indicates the selected item.*

2 Repeatedly press the **Down Arrow** key until **UTILITIES** shows on the screen and is selected. Then press the **GO** key. This displays the Utilities menu.

3 Repeatedly press the **Down Arrow** key until **AMP PROBE SETUP** shows on the screen and is selected. Then press the **GO** key. This displays the Amp Probe Setup screen.

4 The bottom line of the screen shows the amp probe's status. The status must be set to ENABLED. If necessary press the **Up Arrow** key to change the status to ENABLED.

5 Press the **MENU** key twice to return to the main menu.

6 Continue with the Multimeter Test steps that follow.

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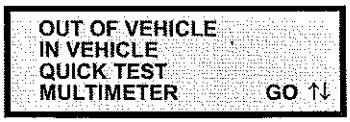
MULTIMETER Test

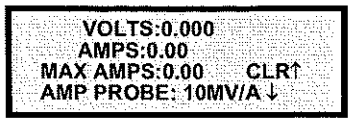
To do the multimeter test, follow these steps:

1 Follow the instructions in "**Pretest Steps**" and "**AMP PROBE SETUP**" on page 9. This displays the main menu.



Note: *The word GO indicates the selected item.*

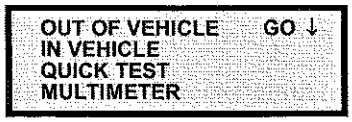
2 Use the **Down Arrow** key to select **MULTIMETER** and then press the **GO** key. This displays a reminder message about the probe setup and then displays the readings, as shown below.



3 The screen displays the voltage, amperes, maximum amperes, and the selected amp probe range. Do either of the following:

- Press the **Up Arrow** key to reset (clear) the readings to zeros.
- Repeatedly press the **Down Arrow** key to change the range. Possible options are 1mV/A, 10mV/A, and 100mV/A.

4 When finished, press the **MENU** key. This displays a reminder message and then displays the main menu, as shown below.



5 Turn off the amp probe. To do this, follow the instructions in "**AMP PROBE SETUP**" on page 9. At step 4, press the **Down Arrow** key to set the amp probe's status to DISABLED.

6 Select another test or disconnect the clamps and the amp probe from the battery.

7 Press the **OFF** key to turn the tester off. (The tester turns off automatically after a few minutes of inactivity.)

4: Utilities

This chapter includes the following sections:

- Set Time / Date
- Software Update
- Unit Version
- Test Counters
- Edit Header or Footer
- Amp Probe Setup
- Stored Tests

Note: *Because the tester shuts off automatically after a few minutes, it may be helpful to connect the tester to a battery before performing the steps in this chapter. (To do this, refer to "**Pretest Steps**" on page 3.)*

Set Time / Date

The Utilities, Set Time / Date function lets you set a date and time for printing on test results.

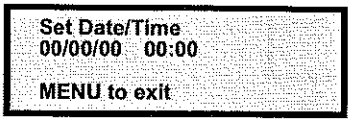
To set the date and time, follow these steps:

1 Press the **ON** key to turn the tester on. This displays the main menu.

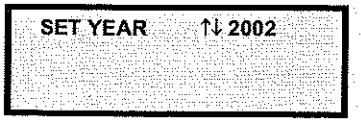
Note: *The word GO indicates the selected item.*

2 Repeatedly press the **Down Arrow** key until **UTILITIES** shows on the screen and is selected. Then press the **GO** key. This displays the Utilities menu.

3 Select **SET TIME/DATE** and then press the **GO** key. This displays the Set Date/Time screen.



4 Press the **GO** key. This displays the Set Year screen.



5 Use the **Up** and **Down Arrow** keys to set the year and then press the **GO** key. Repeat this for each of the next screens that appear for the Month, Date, Hour, and Minutes.

6 When you are finished, the display returns to the Utilities menu. Press the **MENU** key to return to the main menu.

Software Update

The Utilities, Software Update function allows for software updates. Instructions will be provided as updates become available.

Unit Version

The Utilities, Set Version function displays information about the software, such as name, version number, etc.

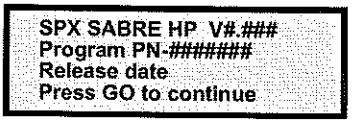
To display the version information, follow these steps:

1 Press the **ON** key to turn the tester on. This displays the main menu.

Note: *The word GO indicates the selected item.*

2 Repeatedly press the **Down Arrow** key until **UTILITIES** shows on the screen and is selected. Then press the **GO** key. This displays the Utilities menu.

3 Use the **Down Arrow** key to select **UNIT VERSION** and then press the **GO** key. This displays the version information.



4 Press the **GO** key to return to the Utilities menu.

5 Press the **MENU** key to return to the main menu.

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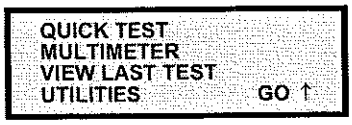
Test Counters

The Utilities, Test Counters function displays the number of System Tests, Battery Tests, and Quick Tests that have been done with the tester and lets you reset the counters to zero.

To display and reset the test counters, follow these steps:

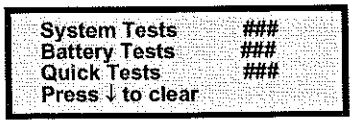
1 Press the **ON** key to turn the tester on. This displays the main menu.



Note: *The word GO indicates the selected item.*

2 Repeatedly press the **Down Arrow** key until **UTILITIES** shows on the screen and is selected. Then press the **GO** key. This displays the Utilities menu.

3 Use the **Down Arrow** key to select **TEST COUNTERS** and then press the **GO** key. This displays the test counts.



4 To reset all the counters to zeros (000), press the **Down Arrow** key.

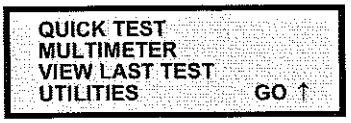
5 When finished, press the **MENU** key twice to return to the main menu.

Edit Header or Footer

The Utilities, Edit Head/Footr function lets you customize information printed on test results, such as shop information or messages to customers.

To edit the header and footer, follow these steps:

1 Press the **ON** key to turn the tester on. This displays the main menu.



Note: *The word GO indicates the selected item.*

2 Repeatedly press the **Down Arrow** key until **UTILITIES** shows on the screen and is selected. Then press the **GO** key. This displays the Utilities menu.

3 Repeatedly press the **Down Arrow** key until **EDIT HEADER/FOOTR** shows on the screen and is selected. Then press the **GO** key. This displays the Edit Header / Footer screen

4 Do one of the following:

Note: *Header information appears at the top of a printed report; footer information appears at the bottom of a printed report.*

- To edit header information, press the **Up Arrow** key.
- To edit footer information, press the **Down Arrow** key.

This displays the edit screen.

5 Enter the desired text as follows:

a Press (and hold down) the **Up Arrow** key until the desired letter or number appears. (After using the Up Arrow key, you can also use the Down Arrow key).

b Press the **GO** key to move to the next space. (Two blinking dots indicate the currently selected space.)

c Repeat a and b until the text is entered.

Note: *To leave a space blank, just press the GO key. To move to the next line, repeatedly press the GO key.*

6 When finished, press the **MENU** key twice to return to the main menu.

Amp Probe Setup

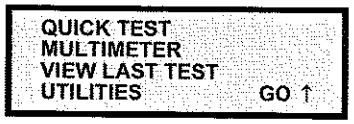
The Utilities, Amp Probe Setup function lets you set up (or turn off) an optional amp probe used with the Multimeter function. For detailed instructions, refer to "**AMP PROBE SETUP**" on page 9.

Stored Tests

The Utilities, Stored Tests function stores up to 25 tests and lets you review them later.

To view stored test results, follow these steps:

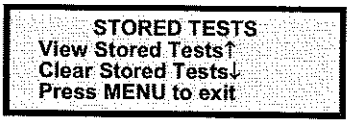
1 Press the **ON** key to turn the tester on. This displays the main menu.



Note: *The word GO indicates the selected item.*

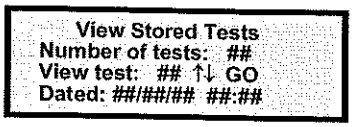
2 Repeatedly press the **Down Arrow** key until **UTILITIES** shows on the screen and is selected. Then press the **GO** key. This displays the Utilities menu.

3 Repeatedly press the **Down Arrow** key until **STORED TESTS** shows on the screen and is selected. Then press the **GO** key. This displays the Stored Tests screen.



4 Do one of the following:

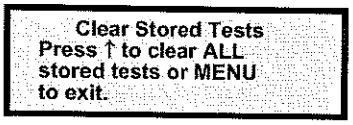
- To view a stored test, press the **Up Arrow** key. This displays the View Stored Tests screen.



This screen shows the number of stored tests, the number of the currently selected test, and the date and time of the currently selected test. Use the **Up** (or **Down**) **Arrow** key to select the test number to view and then press the **GO** key. This displays the results for the selected test.

Note: *If the results have more than one screen, use the Down Arrow key to scroll to the next screen(s). Optionally, press the GO key to print the test results. When finished, press the MENU key to return to the main menu.*

- To clear the stored tests, press the **Down Arrow** key. This displays the Clear Stored Tests screen.



To clear all the stored tests, press the **Up Arrow** key. The message, "ALL TESTS CLEARED" appears on the screen. Use the **MENU** key to return to previous screens.

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User Notes

SPX Corporation Limited Warranty

THIS WARRANTY IS EXPRESSLY LIMITED TO ORIGINAL RETAIL BUYERS OF SPX ELECTRONIC DIAGNOSTIC TOOLS ("UNITS").

SPX Units are warranted against defects in materials and workmanship for three years (36 months) from date of delivery. Cables are warranted against defects in materials and workmanship for 90 days (3 months) from date of delivery. This warranty does not cover any Unit that has been abused, altered, used for a purpose other than that for which it was intended, or used in a manner inconsistent with instructions regarding use. The sole and exclusive remedy for any Unit found to be defective is repair or replacement, at the option of SPX. In no event shall SPX be liable for any direct, indirect, special, incidental or consequential damages (including lost profit) whether based on warranty, contract, tort or any other legal theory. The existence of a defect shall be determined by SPX in accordance with procedures established by SPX. No one is authorized to make any statement or representation altering the terms of this warranty.

DISCLAIMER

THE ABOVE WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

SOFTWARE

Unit software is proprietary, confidential information protected under copyright law. Users have no right in or title to Unit software other than a limited right of use revocable by SPX. Unit software may not be transferred or disclosed without the written consent of SPX. Unit software may not be copied except in ordinary backup procedures.

ORDER INFORMATION

Replacement and optional parts can be ordered directly from your SPX authorized tool supplier. Your order should include the following information:

- quantity
- part number
- item description

Technical Service

If you have any questions on the operation of the product, please call (800) 533-6127.

Repair Service

When sending your SPX electronic product in for repair, please include the following information:

- company name
- contact name
- telephone number
- description of the problem
- proof-of-purchase for warranty repairs
- preferred method of payment for non-warranty repairs

For non-warranty repairs, payment can be made with Visa, Master Card, or with approved credit terms. To receive a credit application, please fax your request to the Credit Department at 800-962-8734.

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9/15/00

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